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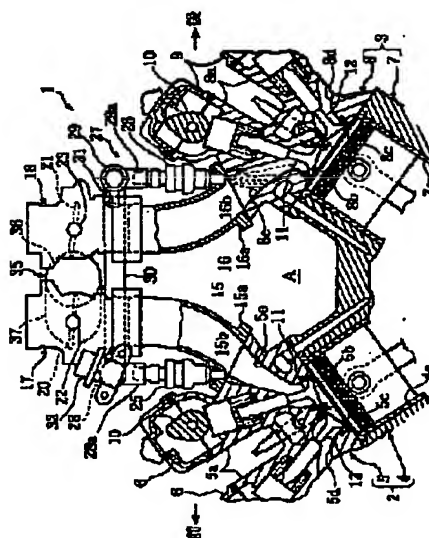
(54) **THROTTLE CONTROL DEVICE FOR V-ENGINE**

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a throttle control device for a V-engine which can avoid upsizing of the whole engine when arranging a drive motor and can make maintenance available easily.

SOLUTION: In this throttle control device, at least two cylinders 4a and 7a having the throttle valves 20 and 21, respectively are arranged so as to form a V-bank. The device is composed such that the opening degree of each of the throttle valves 20 and 21 is controlled by a drive motor 35 based on the operation amount of a throttle member by an artificial operation. In this case, the drive motor 35 is disposed, when watching it in the center line direction of the V-bank A, to be positioned therein.

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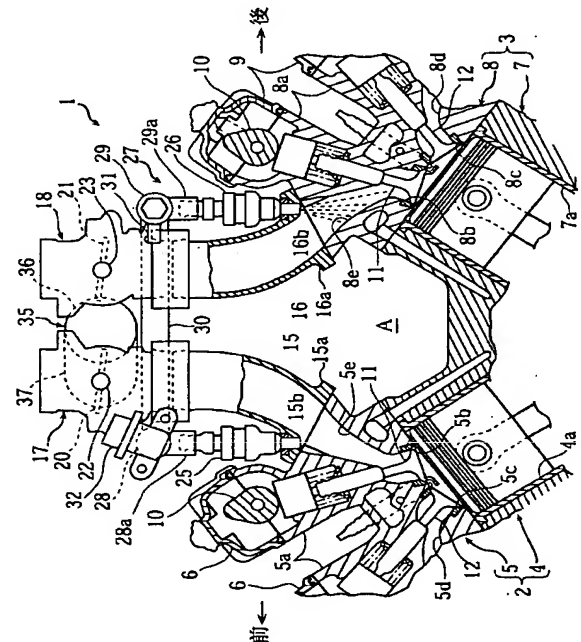
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(54) 【発明の名称】 V型エンジンのスロットル制御装置

(57) 【要約】

【課題】 駆動モータを配置する場合のエンジン全体の大型化を回避できるとともに、メンテナンスを容易に行えるV型エンジンのスロットル制御装置を提供する。

【解決手段】 少なくとも2つの気筒4a, 7aをVバンクをなすように配置し、各気筒毎にスロットル弁20, 21を備え、該各スロットル弁20, 21の開度をスロットル部材の人為操作によるスロットル操作量に基づいて駆動モータ35により制御するようにしたスロットル制御装置において、上記駆動モータ35を上記VバンクAの中心線方向に見たとき該VバンクA内に位置するように配置する。



English Translation of

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Title: THROTTLE CONTROL DEVICE FOR V-ENGINE

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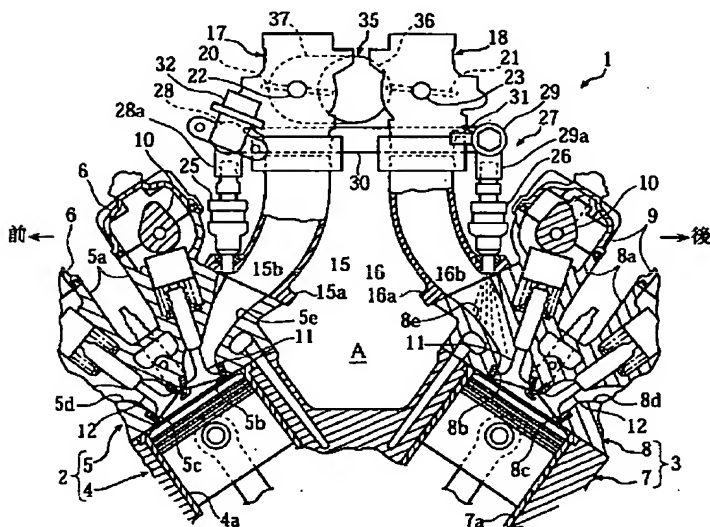
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[Abstract]

PROBLEM TO BE SOLVED: To provide a throttle control device for a V-engine which can avoid upsizing of the whole engine when arranging a drive motor and can make maintenance available easily.

SOLUTION: In this throttle control device, at least two cylinders 4a and 7a having the throttle valves 20 and 21, respectively are arranged so as to form a V-bank. The device is composed such that the opening degree of each of the throttle valves 20 and 21 is controlled by a drive motor 35 based on the operation amount of a throttle member by an artificial operation. In this case, the drive motor 35 is disposed, when watching it in the center line direction of the V-bank A, to be positioned therein.



[Claim(s)]

[Claim 1] The throttle control device of the V-type engine characterized by having arranged at least two gas columns so that V bank may be made, and having arranged so that it may be located in these V banks in the throttle control device of the V-type engine which is equipped with a throttle valve for every gas column, and controlled the opening of each of this throttle valve by the drive motor based on the throttle control input by artificial actuation of a throttle member, when the above-mentioned drive motor is seen in the direction of a center line of the above-mentioned V bank.

[Claim 2] The throttle control unit of the V-type engine characterized by on the other hand controlling the above-mentioned throttle valve by the drive motor of the above-mentioned V bank which became independent for every gas column of another side in claim 1.

[Claim 3] The throttle control unit of the V-type engine characterized by attaching housing of the above-mentioned drive motor in a throttle body in one in claim 1 or 2.

[Claim 4] The throttle control unit of the V-type engine characterized by attaching housing of the above-mentioned drive motor in the fuel feeding pipe which supplies a fuel to a fuel injection valve in one in claim 1 or 2.

[Claim 5] The throttle control unit of the V-type engine characterized by for housing of the above-mentioned drive motor making an elastic member placed between the cylinder heads, and attaching it in them directly in claim 1 or 2.

[Claim 6] The throttle control unit of the V-type engine characterized by setting they being [any / claim 1 thru/or / of 5], and forming the air passage for taking out inhalation-of-air negative pressure to HAUJIGU of the above-mentioned drive motor.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the throttle control unit of the V-type engine which controlled the opening of a throttle valve by the drive motor based on the throttle closing motion input by carrying out artificial actuation of the throttle members, such as a throttle grip and an accelerator pedal.

[0002]

[Description of the Prior Art] In recent years, the control input of a throttle grip or an accelerator pedal is detected, and the so-called electronic throttle control unit which was made to carry out drive control of the opening of a throttle valve with a drive motor based on this control input is proposed.

[0003] While arranging a drive motor etc. in a compact as much as possible in arranging in the motor bicycle with which this kind of throttle control device was carried in the V-type engine, considering that car body structure, it is desirable to enable it to maintain easily.

[0004]

[Problem(s) to be Solved by the Invention] however, arrangement of the above-mentioned drive motor -- depending on how, it can respond to neither above-mentioned miniaturization nor the request on a maintenance disposition For example, when the drive motor has been arranged so that the heel of the valve stem of a throttle valve may be countered, there is concern that the whole engine is enlarged so much, from a drive motor projecting outside. Moreover, when the above-mentioned drive motor is attached in an engine or a car body through stay etc., there is a problem that components mark increase.

[0005] This invention was made in view of the above-mentioned actual condition, and it aims at offering the throttle control unit of the V-type engine which can maintain easily while it can avoid enlargement of the whole engine in the case of arranging a drive motor.

[0006]

[Means for Solving the Problem] About at least two gas columns, as invention of claim 1 makes V bank, it arranges and it becomes, and in the throttle control device of the V-type engine which controlled the opening of a throttle valve by the drive motor based on the throttle control input by artificial actuation of a throttle member, when the above-mentioned drive motor is seen in the direction of a center line of the above-mentioned V bank, it is characterized by having arranged so that it may be located in these V banks.

[0007] Invention of claim 2 is characterized by on the other hand controlling the above-mentioned throttle valve by the drive motor of the above-mentioned V bank which became independent for every gas column of another side in claim 1.

[0008] Invention of claim 3 is characterized by attaching housing of the

above-mentioned drive motor in a throttle body in one in claim 1 or 2.

[0009] Invention of claim 4 is characterized by attaching housing of the above-mentioned drive motor in the fuel feeding pipe which supplies a fuel to a fuel injection valve in one in claim 1 or 2.

[0010] Invention of claim 5 is characterized by for housing of the above-mentioned drive motor making an elastic member placed between the cylinder heads, and attaching it in them directly in claim 1 or 2.

[0011] Invention of claim 6 is characterized by setting they being [any / claim 1 thru/or / of 5], and forming the air passage for taking out inhalation-of-air negative pressure to HAUJIGU of the above-mentioned drive motor.

[0012]

[Function and Effect of the Invention] According to the throttle control device concerning this invention, since the drive motor has been arranged in V bank, engine free space can be used effectively, a drive motor can be arranged, and engine enlargement can be avoided. Moreover, when maintaining, it can carry out easily from a way outside V bank.

[0013] In invention of claim 2, since the above-mentioned throttle valve was controlled by the drive motor of the above-mentioned V bank which carried out independent arrangement for every gas column of another side on the other hand, when one drive motor breaks down by a certain cause, it becomes possible to continue operation with the drive motor of another side, and dependability and safety can be raised.

[0014] In invention of claim 3, since housing of the above-mentioned drive motor was attached in the throttle body in one, the attachment nature to an engine can be improved by only the part which can make stay etc. unnecessary being able to reduce components mark, and attaching a drive motor to a throttle body beforehand.

[0015] In invention of claim 4, since housing of a drive motor was attached in the fuel feeding pipe of a fuel injection valve in one, while being able to aim at reduction of components mark, the attachment nature to an engine can be improved like claim 3.

[0016] Anchoring reinforcement can be raised in invention of claim 5, avoiding the effect on the drive motor according housing of a drive motor to engine vibration by that of a direct attachment beam through an elastic member to the cylinder head.

[0017] In invention of claim 6, since the air passage for taking out inhalation-of-air negative pressure in housing of a drive motor was formed, the conventional exclusive air hose can be made unnecessary and the circumference of an engine can be simplified.

[0018]

[Embodiment of the Invention] The gestalt of operation of this invention is explained based on an accompanying drawing below.

[0019] Drawing 1 thru/or drawing 3 are drawings for explaining the throttle control unit of the V-type engine by 1 operation gestalt (the 1st operation gestalt) of invention of claim 1, and drawing 1, the cross-section side elevation of a V-type engine in which, as for drawing 2, the throttle control unit was arranged, respectively, a top view, and drawing 3 are the top views of a drive motor.

[0020] In drawing, 1 shows the water cooling type four-cycle V type 4-cylinder engine adopted as a motor bicycle, a before side, about the backside blocks 2 and 3, as this engine 1 makes the predetermined angle of bank before a car and to the backside, it arranges and it becomes, and it turns the cross direction and the common crankshaft (un-illustrating) is carried in the car-body frame (un-illustrating).

[0021] Before really forming the before [the above] side block 2 in the anterior part of a crank case (un-illustrating), and having the before [a right-and-left pair] side gas columns 4a and 4a, and bolting association is carried out at the side cylinder block 4 and the upper connecting face of this, it has the side cylinder head 5 and the upper connecting face of cam case section 5a of the before [this] side cylinder head 5 is equipped with the before side cylinder-head cover 6.

[0022] Moreover, the backside [the above] block 3 was really formed in the posterior part of a crank case, after having the backside [a Uichi Hidari pair] gas columns 7a and 7a like the above and being combined with the side cylinder block 7 and the upper connecting face of this, it has the side cylinder head 8, and cam case section 8a of the backside [this] cylinder head 8 is equipped with the backside cylinder-head cover 9.

[0023] The inhalation-of-air valve-opening openings 5b and 8b and the exhaust valve openings 5c and 8c are carrying out opening to the crevice which forms the combustion chamber of the backside cylinder heads 5 and 8 the before [the above] side, each of these inhalation-of-air valve-opening openings 5b and 8b are opened and closed by inlet valves 11 and 11, and each exhaust valve openings 5c and 8c are opened and closed with exhaust valves 12 and 12. The closing motion drive of the above-mentioned inlet valve 11 and the exhaust valve 12 is carried out with the air inlet cam shaft 10 and an exhaust cam shaft (un-illustrating), respectively.

[0024] The side exhaust pipe is connected to side exhaust air port 8d after un-illustrating at before [the right and left which carry out opening to the before / a car / side of the before / the above / side cylinder head 5] side exhaust air port 5d after the right and left in which a before [un-illustrating] side exhaust pipe carries out opening to the backside [a car] of the backside cylinder head 8.

[0025] Down-stream **** of the before side inlet pipe 15 is connected to before [the right and left prolonged in the V bank A inside] side suction-port 5e from inhalation-of-air valve-opening opening 5b of the before [the above] side cylinder head 5, and the backside inlet pipe 16 is connected to suction-port 8e of the right

and left prolonged in the V bank A inside from inhalation-of-air valve-opening opening 8b of the backside [the above] cylinder head 8. The before [this] side, the backside inlet pipes 15 and 16 are prolonged in the abbreviation perpendicular upper part so that the symmetry may be made.

[0026] The backside throttle bodies 17 and 18 are connected to the upper edge of the backside inlet pipes 15 and 16 the before side each above-mentioned forward side, and opening of the air suction port of each throttle bodies 17 and 18 is carried out into the air cleaner (un-illustrating). In inhalation-of-air path 17a of each of these throttle bodies 17 and 18, and 18a, the butterfly type throttle valves 20 and 21 are arranged possible [closing motion] between the closed position and the open position. Throttle-valve 20 comrades of before [this] side right and left are connected by the common valve stem 22, and throttle-valve 21 comrades of backside right and left are connected by the same common valve stem 23. The return spring (un-illustrating) which energizes throttle valves 20 and 21 to a closed position is arranged in each of these valve stems 22 and 23. Moreover, the right end of the valve stem 22 by the side of before is equipped with the throttle opening sensor 24.

[0027] The valve ports 15b and 16b which are open for free passage to suction ports 5e and 8e are formed before [of the down-stream edge flanges 15a and 16a of the backside inlet pipes 15 and 16] a car, and in the backside the before [the above] side, and it is equipped with fuel injection valves 25 and 26 so that an injection nozzle may be located in this each valve port 15b and 16b. Each of these fuel injection valves 25 and 26 are arranged so that it may be located between inlet pipes 15 and 16 and the cam case sections 5a and 8a and the perpendicular upper part may be turned to in parallel mutually. The fuel from each of these fuel injection valves 25 and 26 is injected towards the umbrella part rear face of an inlet valve 11 through suction ports 5e and 8e.

[0028] The common fuel-supply unit 27 is connected to each above-mentioned fuel injection valves 25 and 26. By plane view, this fuel-supply unit 27 connects the cross direction right end of the before side fuel feeding pipe 28, and the right end of the backside fuel feeding pipe 29 in the shape of a KO character by the interconnecting tube 30, unifies, and it is arranged so that the outside of each throttle bodies 17 and 18 may be surrounded.

[0029] Insertion connection of the upper limit section of each fuel injection valve 26 on the backside is made at end-connection 29a by which insertion connection of the upper limit section of each fuel injection valve 25 by the side of before is made at end-connection 28a by which the branching was carried out to the before [the above] side fuel feeding pipe 28, and the branching was carried out to the backside fuel feeding pipe 29.

[0030] Moreover, the fuel pump (un-illustrating) is connected to the upper edge (left end section) of the backside [the above] fuel feeding pipe 29 through the fuel supply

hose 31, the regulator 32 which adjusts fuel pressure is connected to the down-stream edge (left-hand side edge) of the before side fuel feeding pipe 28, and the return pipe 33 from this regulator 32 is connected to the fuel tank (un-illustrating).

[0031] And each above-mentioned throttle valves 20 and 21 and a throttle grip (un-illustrating) are connected through the throttle control unit. This throttle control unit consists of a control input detection sensor (un-illustrating) which detects the control input (the amount of rotation) of the throttle grip by the operator, a drive motor 35 which carries out the closing motion drive of each above-mentioned throttle valves 20 and 21, and a controller (un-illustrating) which carries out drive control of the above-mentioned drive motor 35 based on the detection value from the above-mentioned control input detection sensor.

[0032] The above-mentioned drive motor 35 is arranged in the space surrounded by each throttle bodies 17 and 18 in the V bank A while it turns revolving-shaft 35a of this in parallel with valve stems 22 and 23.

[0033] This drive motor 35 is contained in the housing 36 made from aluminum dies casting, it attaches and this housing 36 is being fixed so that throttle bodies 17 and 18 may be built through non-illustrated stay. In the above-mentioned housing 36, connection formation of the gear case 37 is carried out at one. In this gear case 37, as shown in drawing 3, the reduction gear device is contained. The throttle gear 38 by which wearing immobilization of this reduction gear device was carried out in the center section of the valve stem 22 by the side of before, The rotation gear 39 by which wearing immobilization was carried out at revolving-shaft 35a of the above-mentioned drive motor 35, Large reduction gear 40a with which it has the middle gear train 40 which gears on both the gears 38 and 39, and this middle gear train 40 gears on the rotation gear 39, It consists of small reduction gear 40b which gears on the above-mentioned throttle gear 38, and gear shaft 40c of both the reduction gears 40a and 40b is supported to revolve by the gear case 37.

[0034] The valve stem 22 by the side of before the above and the valve stem 23 on the backside are connected through the link mechanism 41. This link mechanism 41 is the thing of the outline structure which connected with the left end section of the valve stem 22 by the side of before the driving link member 42 by which wearing immobilization was carried out, and the follower link member 43 by which wearing immobilization was carried out at the left end section of the valve stem 23 on the backside rotatable by the arm member 44, and if the valve stem 22 by the side of before rotates by this, synchronizing with this rotation, the valve stem 23 on the backside will rotate it.

[0035] Next, the operation effectiveness of this operation gestalt is explained.

[0036] If an operator does rotation actuation of the throttle grip, a drive motor 35 rotates according to that control input, this rotation will be transmitted to the valve

stem 22 by the side of before through each gears 39, 40, and 38, and the throttle valve 20 by the side of before will rotate with rotation of this valve stem 22. Moreover, it is transmitted to the valve stem 23 on the backside through a link mechanism 41, this valve stem 23 rotates synchronizing with the above-mentioned valve stem 22, and the throttle valve 21 on the backside rotates rotation of the valve stem 22 by the side of before with rotation of this valve stem 23.

[0037] Since according to the throttle control device of this operation gestalt it has arranged to the space which is in these V banks A, and was surrounded by four throttle bodies 17, 17, 18, and 18 when a drive motor 35 is seen in the direction of a center line of the V bank A, the free space of an engine 1 is used effectively, a drive motor 35 can be arranged, engine enlargement can be avoided by this, and it can respond to the request of miniaturization. Moreover, when maintaining, by removing a fuel tank, it can carry out easily from the upper part of the V bank A, and workability can be improved.

[0038] Moreover, since it attached and fixed so that throttle bodies 17 and 18 might be built over the housing 36 of the above-mentioned drive motor 35 through stay, while the anchoring reinforcement of a drive motor 35 is securable, the connection reinforcement of a throttle body 17 and 18 comrades can be raised.

[0039] Since the rotation drive of the throttle valve 20 by the side of before was carried out with one more drive motor 35 and rotation of the throttle valve 20 by the side of before this was transmitted to the throttle valve 21 on the backside through the link mechanism 41, it is low cost and synchronous rotation of the four throttle valves 20 and 21 can be carried out to it being also at easy structure.

[0040] In addition, although the above-mentioned operation gestalt explained the case where it was made to transmit rotation of a drive motor 35 to a valve stem 22 through each gears 39, 40, and 38 to the example, this invention is not restricted to this and you may make it transmit rotation of a drive motor 35 to a valve stem 22 with a link mechanism, wire styles, or such combination.

[0041] For example, drawing 4 shows the modification of the moderation device of a drive motor, and shows that the same sign as drawing 3 is the same, or a considerable part among drawing. This is the example which moderation chain-sprocket 40a was meshed on the rotation gear 39 of a drive motor 35, and connected gear shaft 40c of this moderation chain-sprocket 40a, and a valve stem 22 through the link mechanism 45. This link mechanism 45 is the thing of the structure which connected the driving link member 46 fixed to gear shaft 40c, and the follower link member 47 fixed to the valve stem 22 rotatable by the arm member 47, and the same effectiveness as the above-mentioned operation gestalt is acquired also in this case. In addition, 48 is a return spring which always energizes a throttle valve 20 to a closed position.

[0042] Drawing 5 is drawing for explaining the throttle control unit by the 2nd

operation gestalt of invention of claim 1. The same sign as drawing 2 being the same or the explanation about a sign which shows the considerable part and overlaps is omitted among drawing.

[0043] In the throttle control device of this operation gestalt, one drive motor 50 is arranged in the center section in the V bank A, and this drive motor 50 turns each revolving shafts 50a and 50a in valve stems 22 and 23 and the direction of a right angle, and is arranged. And each above-mentioned revolving-shaft 50a is equipped with the worm gearing 51, and this each worm gearing 51 has got into gear to the worm gears 52 and 52 by which wearing immobilization was carried out at each valve stems 22 and 23.

[0044] With this operation gestalt, since it was made to carry out the rotation drive of the valve stems 22 and 23 on before and the backside with one drive motor 50 arranged in the V bank A, it is low cost, and synchronous rotation of the four throttle valves 20 and 21 can be carried out to it being also at easy structure, and the same effectiveness as the 1st operation gestalt is acquired.

[0045] Drawing 6 and drawing 7 are drawings for explaining the throttle control unit by claim 1 and 1 operation gestalt (the 3rd operation gestalt) of invention of three, and show that the same sign as drawing 2 is the same, or a considerable part among drawing.

[0046] In the throttle control device of this operation gestalt, it attaches and the drive motor 55 is being fixed so that it may be arranged among the back throttle bodies 17 and 18 in front of the left-hand side in the V bank A and both the throttle bodies 17 and 18 may be built.

[0047] Moreover, the above-mentioned drive motor 55 turns revolving-shaft 55a in parallel with the valve stems 22 and 23 on before and the backside, and is arranged, and this revolving-shaft 55a and each valve stems 22 and 23 are connected by the link mechanism 56. This link mechanism 56 has structure which connected the driving member 57 fixed to the above-mentioned revolving-shaft 55a, and the follower members 58 and 58 fixed to the left end section of each valve stems 22 and 23 with the link arms 59 and 59. In addition, an arrow head a shows a motor rotation direction, and an arrow head b shows a throttle-valve hand of cut.

[0048] While arranging a drive motor 55 at the left-hand side edge in the V bank A according to this operation gestalt Since it was made to carry out the rotation drive of the valve stems 22 and 23 on before and the backside with one drive motor 55 through the link mechanism 56, it is low cost, and synchronous rotation of the four throttle valves 20 and 21 can be carried out to it being also at easy structure, and the same effectiveness as the above-mentioned 1st and 2nd operation gestalt is acquired.

[0049] With this operation gestalt, since the throttle bodies 17 and 18 on [front] the backside were built over the drive motor 55 and it fixed, components mark can be

reduced compared with the case where it fixes through another members, such as stay. Moreover, the attachment nature to an engine can be improved by attaching a drive motor 55 to throttle bodies 17 and 18 beforehand at one. Moreover, the above-mentioned drive motor 55 will function as a reinforcement member of both the throttle bodies 17 and 18, and reinforcement by another member can be made unnecessary.

[0050] Drawing 8 is drawing for explaining the throttle control unit by claims 2 and 3 and 1 operation gestalt (the 4th operation gestalt) of invention of six. The same sign as drawing 2 shows the same or a considerable part among drawing.

[0051] The throttle control device of this operation gestalt arranges two drive motors 60 and 60 in the V bank A, and it is constituted so that the valve stem 22 by the side of before and the valve stem 23 on the backside may be driven independently with each drive motor 60. The gear case 61 is contained by one in the housing 62 by which connection formation was carried out, and the fundamental structure of each of this drive motor 60 is the same as the above-mentioned 1st operation gestalt (refer to drawing 3).

[0052] Each above-mentioned drive motor 60 is being built over, attached and fixed to the back throttle bodies 17 and 18 the front, and each gear case 61 is connected with the center section of the valve stems 22 and 23 of the V bank A inside.

[0053] The air passage (un-illustrating) for taking out inhalation of air negative pressure is formed in the anchoring connecting face of each above-mentioned drive motor 60 and throttle bodies 17 and 18. Thus, since the air passage was formed using the anchoring connecting face of a drive motor 60 and throttle bodies 17 and 18, the air hose of dedication can be made unnecessary and the circumference of an engine can be simplified.

[0054] According to this operation gestalt, since it was made to carry out the rotation drive of each valve stems 22 and 23 with two drive motors 60 independently, when one motor breaks down by a certain cause, operation can be continued with the drive motor of another side, and dependability and safety can be raised.

[0055] Moreover, since the throttle bodies 17 and 18 on [front] the backside were built over each drive motor 60 and it fixed, components mark can be reduced compared with the case where it fixes through another members, such as stay, and the same effectiveness as the above-mentioned 3rd operation gestalt is acquired.

[0056] In addition, although the above-mentioned operation gestalt explained the case where turned the gear case 61 of each drive motor 60 to the V bank A inside, and it had been arranged, a gear case 61 is turned to a V bank A outside, and is arranged, and you may make it drive the heels 22a and 23a of each valve stems 22 and 23 in this invention (refer to the two-dot chain line of drawing 8).

[0057] Drawing 9 and drawing 10 are drawings for explaining the throttle control unit by claim 1 and 1 operation gestalt (the 5th operation gestalt) of invention of

four. The same sign as drawing 1 and drawing 2 shows the same or a considerable part among drawing.

[0058] Before the throttle control unit of this operation gestalt supplies a high-pressure fuel to each fuel injection valves 25 and 26, it arranges the side fuel feeding pipe 28 and the backside fuel feeding pipe 29 among the backside throttle bodies 17 and 18 a before side, and has composition which is in the V bank A, and built the central subordinate side of both the fuel feeding pipes 28 and 29 over one drive motor 65, attached it, and was fixed.

[0059] Insertion connection is made from the throttle valves 20 and 21 of throttle bodies 17 and 18 at the valve ports 17b and 18b formed in the downstream part, and each above-mentioned fuel injection valves 25 and 26 make it incline inside to the axis of throttle bodies 17 and 18, and are arranged. Moreover, the left end sections of each valve stems 22 and 23 are connected by the link mechanism 41 of the same structure as the above-mentioned 1st operation gestalt.

[0060] A gear case 61 is contained by one in the housing 62 by which connection formation was carried out, and is connected with the valve stem 23 on the backside, and the fundamental structure of the above-mentioned drive motor 65 is the same as the above-mentioned 1st and 4th operation gestalt.

[0061] Since according to this operation gestalt a before side and the backside fuel feeding pipes 28 and 29 were built over this drive motor 65 and it fixed while having arranged the drive motor 65 in the V bank A, components mark can be reduced compared with the case where it fixes through another members, such as stay, and the above-mentioned drive motor 65 will function as a reinforcement member of both the fuel feeding pipes 28 and 29, and reinforcement by another member can be made unnecessary.

[0062] Drawing 11 and drawing 12 are drawings for explaining the throttle control unit by claim 2 and 1 operation gestalt (the 6th operation gestalt) of invention of four, and show that the same sign as drawing 9 and drawing 10 is the same, or a considerable part among drawing.

[0063] The throttle control unit of this operation gestalt has composition which has arranged the side fuel feeding pipe 28 and the backside fuel feeding pipe 29 among the backside throttle bodies 17 and 18 the before side, is in the V bank A and has arranged two drive motors 66 and 66 in the both-ends lower part of both the fuel feeding pipes 28 and 29, before supplying a high-pressure fuel to each fuel injection valves 25 and 26.

[0064] Valve-stem 22' of each throttle body 17 by the side of before the above and valve-stem 23' of each throttle body 18 on the backside have been independent, respectively, and valve-stem 22' on before [this] and the backside and 23' are connected by link mechanisms 41 and 41. This link mechanism 41 is the thing of the same structure as the above-mentioned 1st and 5th operation gestalt.

[0065] The gear case 61 is contained by one in the housing 62 by which connection formation was carried out, and each above-mentioned drive motor 65 is connected with valve-stem 22' by the side of before, and valve-stem 23' on the backside, respectively.

[0066] According to this operation gestalt, since it was made to carry out the rotation drive of valve-stem 22' of the front back, and 23' with two drive motors 66, when one motor breaks down by a certain cause, operation can be continued with the drive motor of another side, and dependability and safety can be raised.

[0067] In addition, although each above-mentioned operation gestalt explained the case where attached the drive motor in the throttle body or the fuel feeding pipe, and it fixed, in this invention, direct anchoring immobilization could be carried out through the elastic member at the cylinder head, and invention of claim 5 carried out the drive motor in this way. In this case, since the anchoring reinforcement of a drive motor can be raised and engine vibration is absorbed by the elastic member, the effect on the above-mentioned drive motor can be controlled.

[Brief Description of the Drawings]

[Drawing 1] It is a cross-section side elevation for explaining the throttle control unit of the V-type engine by the 1st operation gestalt of invention of claim 1.

[Drawing 2] It is the engine top view in which the above-mentioned throttle control device was arranged.

[Drawing 3] It is the top view showing the reduction gear device of the drive motor of the above-mentioned throttle control unit.

[Drawing 4] It is the top view showing the moderation device by the modification of the above-mentioned operation gestalt.

[Drawing 5] It is a top view for explaining the throttle control unit by the 2nd operation gestalt of invention of claim 1.

[Drawing 6] It is a top view for explaining the throttle control unit by the 3rd operation gestalt of invention of claim 1.

[Drawing 7] It is the side elevation showing the link mechanism of the drive motor of the above-mentioned throttle control unit.

[Drawing 8] It is a top view for explaining the throttle control unit by claims 2 and 3 and the 4th operation gestalt of invention of six.

[Drawing 9] It is a cross-section side elevation for explaining the throttle control unit by claim 1 and the 5th operation gestalt of invention of four.

[Drawing 10] It is the top view of the above-mentioned throttle control unit.

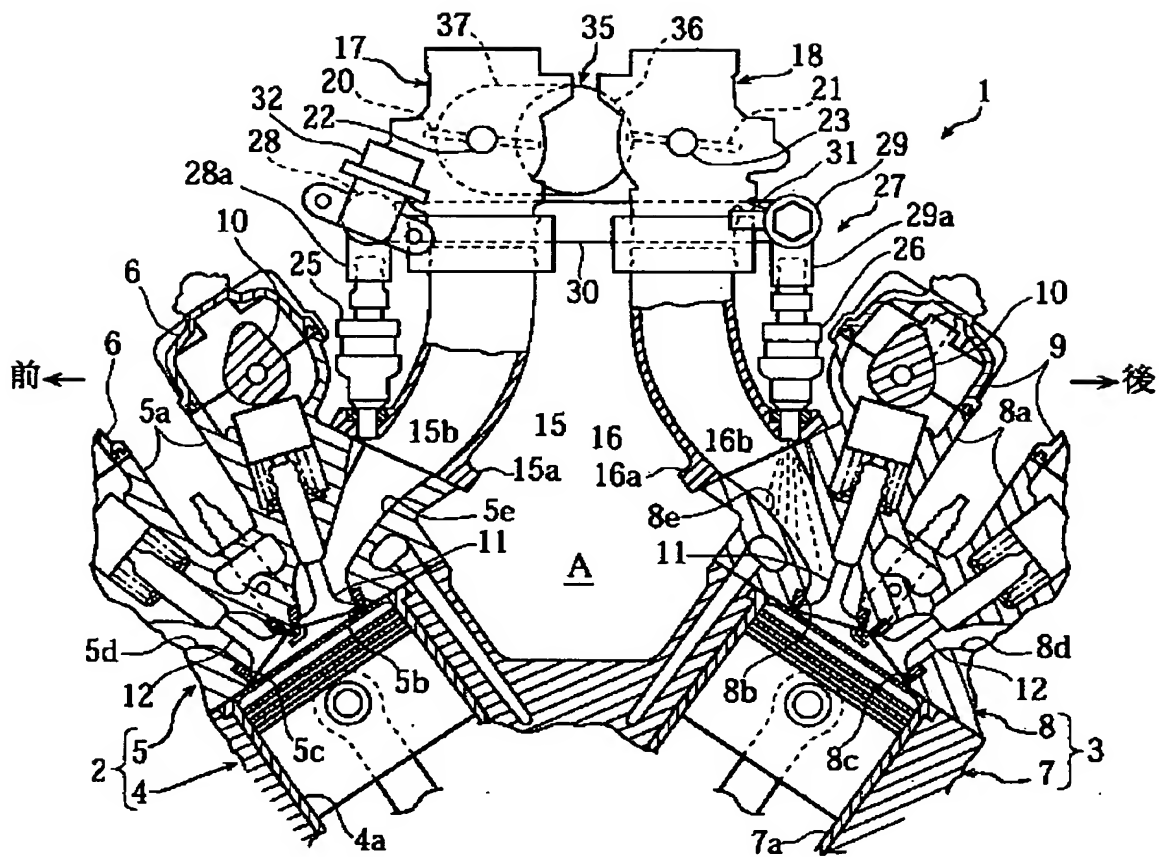
[Drawing 11] It is a cross-section side elevation for explaining the throttle control unit by claim 2 and the 6th operation gestalt of invention of four.

[Drawing 12] It is the top view of the above-mentioned throttle control unit.

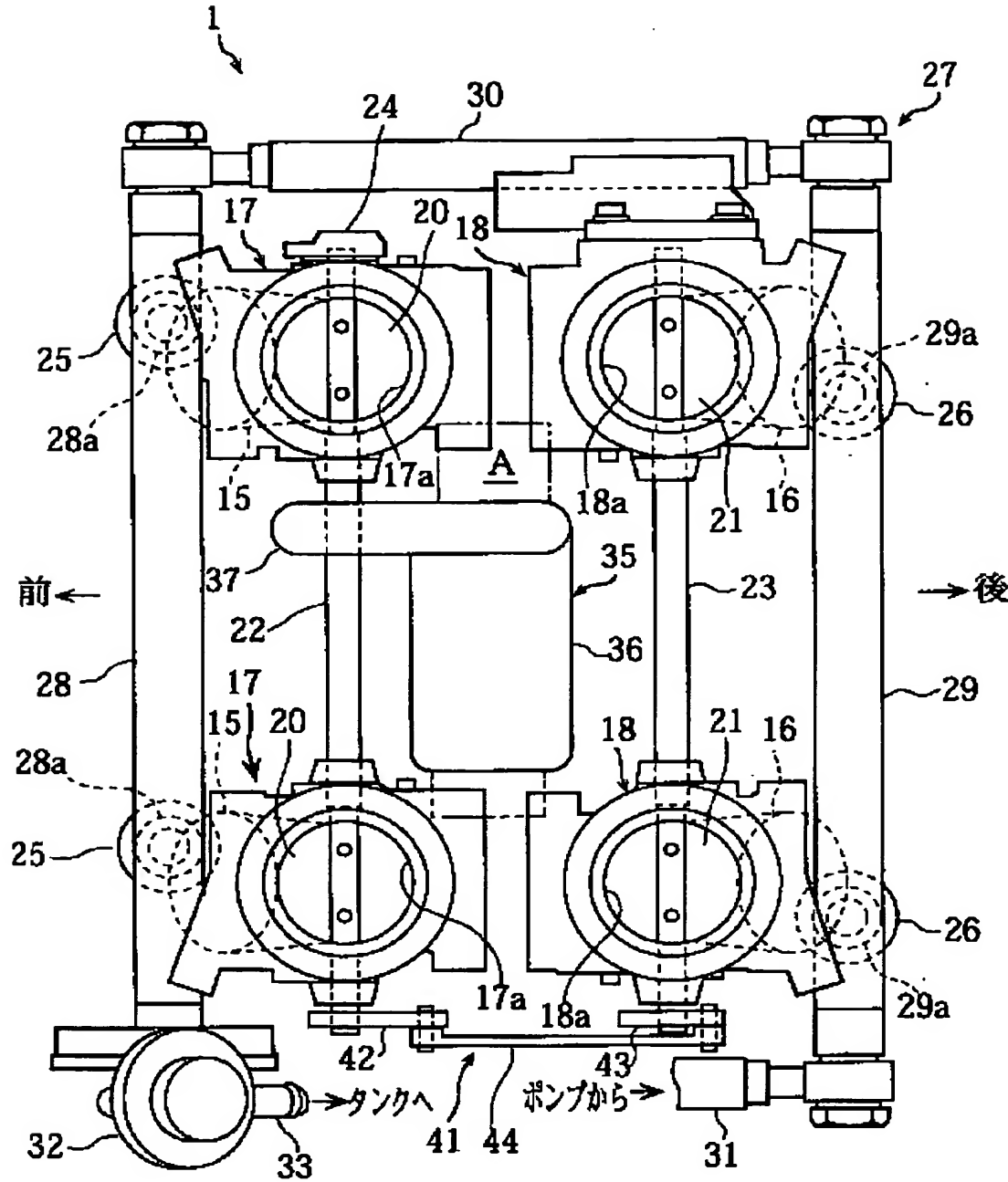
[Description of Notations]

- 1 V-type Engine
 4a, 7a Gas column
 20 21 Throttle valve
 35, 50, 55, 60, 65, 66 Drive motor
 36 62 Housing
 17 18 Throttle body
 25 26 Fuel injection valve
 28 29 Fuel feeding pipe
 A V bank

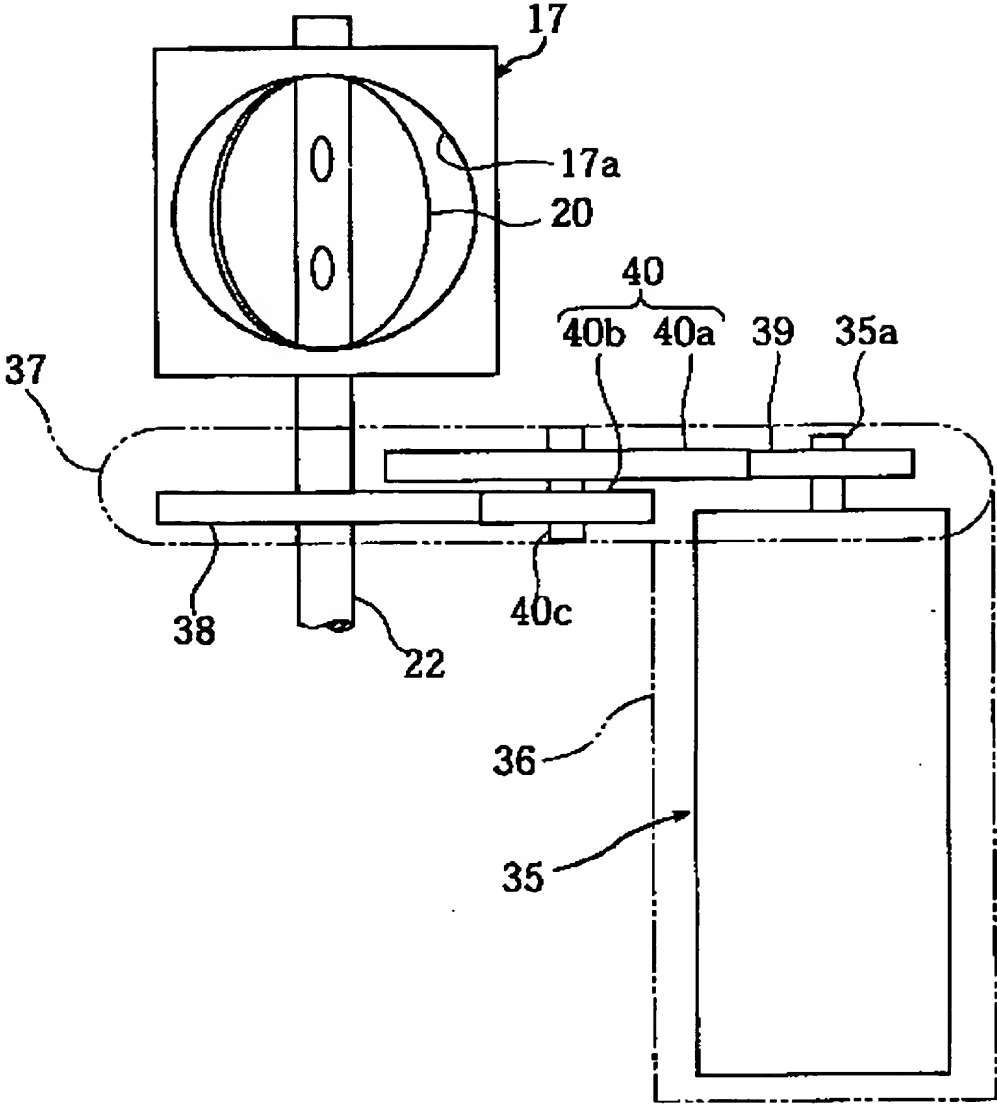
[Drawing 1]



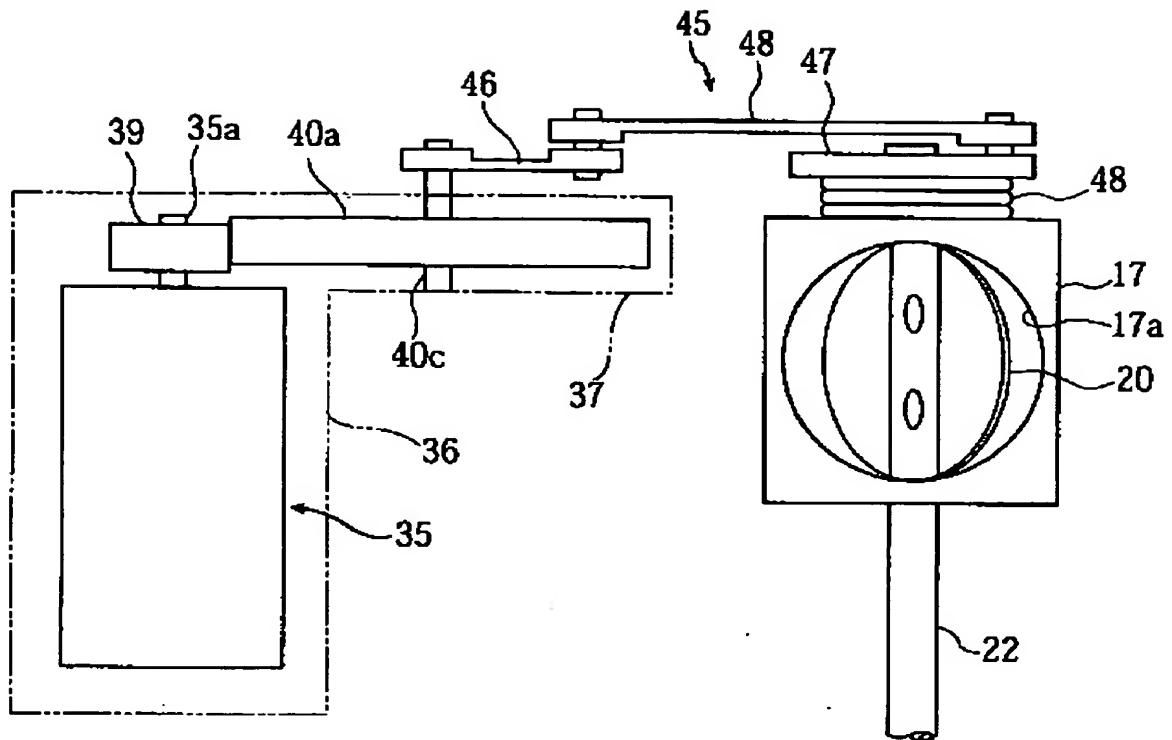
[Drawing 2]



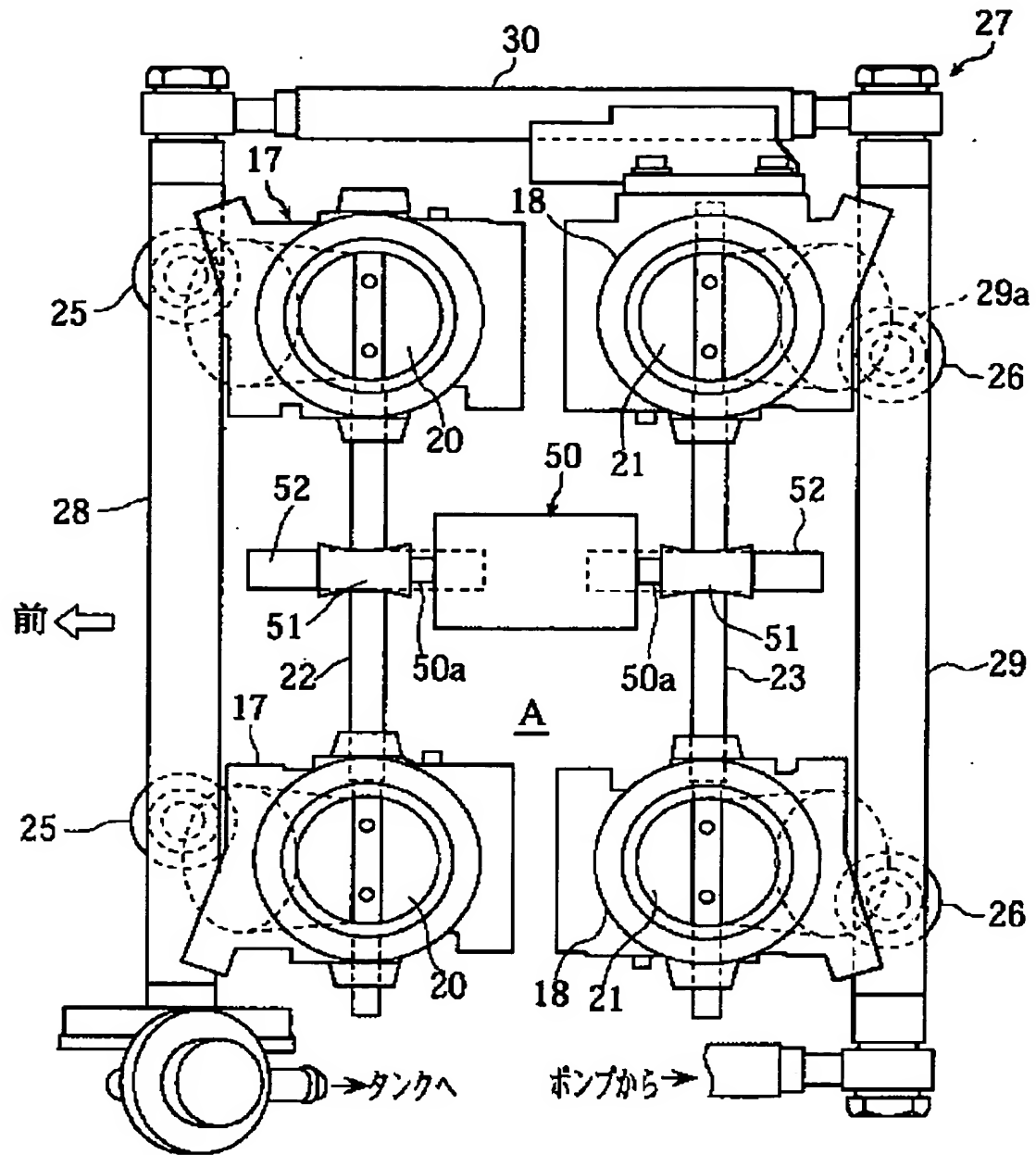
[Drawing 3]



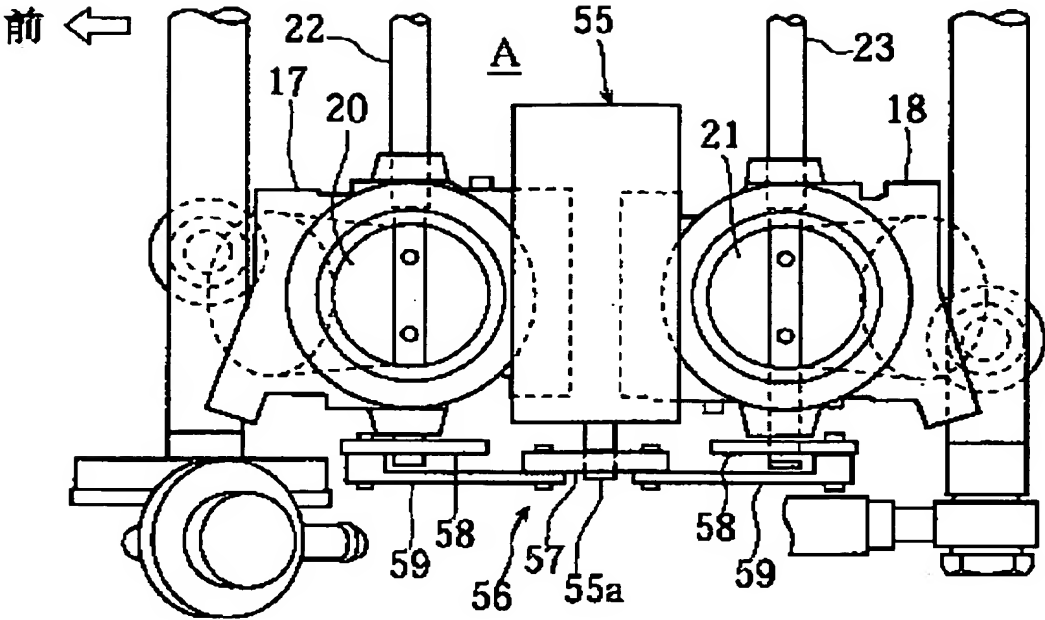
[Drawing 4]



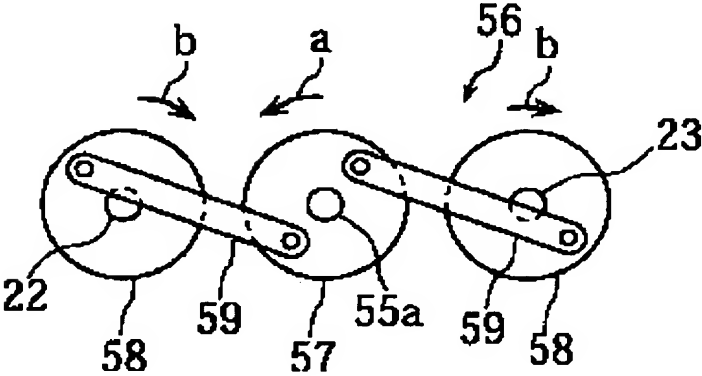
[Drawing 5]



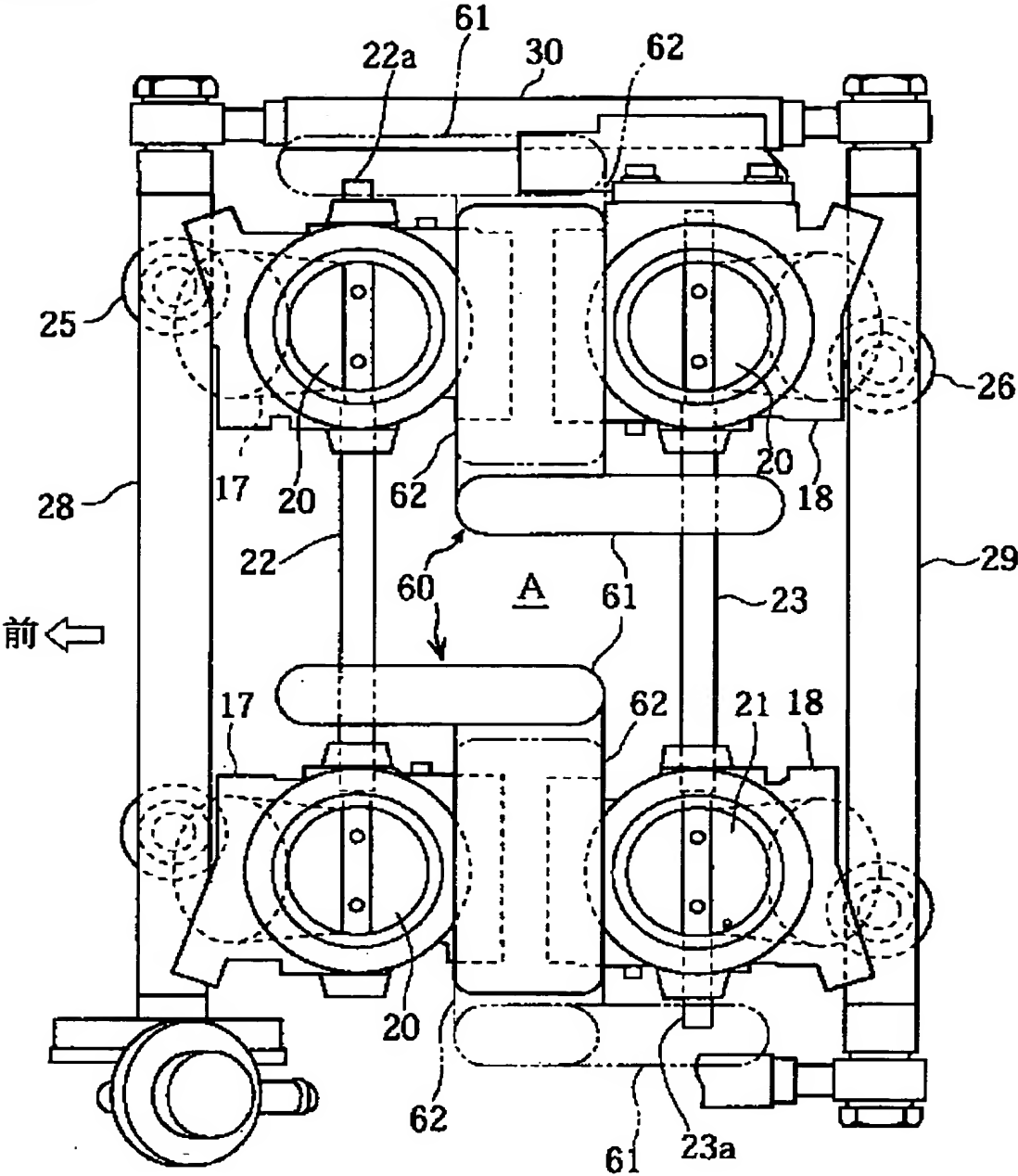
[Drawing 6]



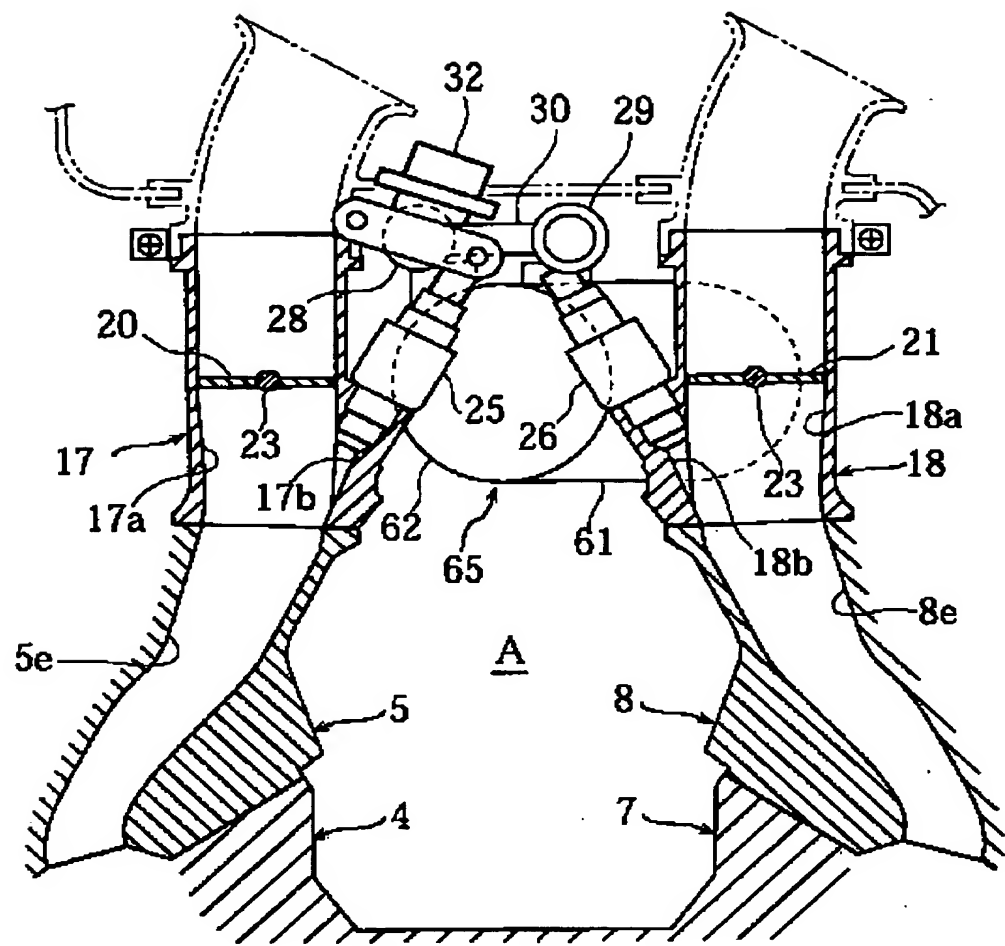
[Drawing 7]



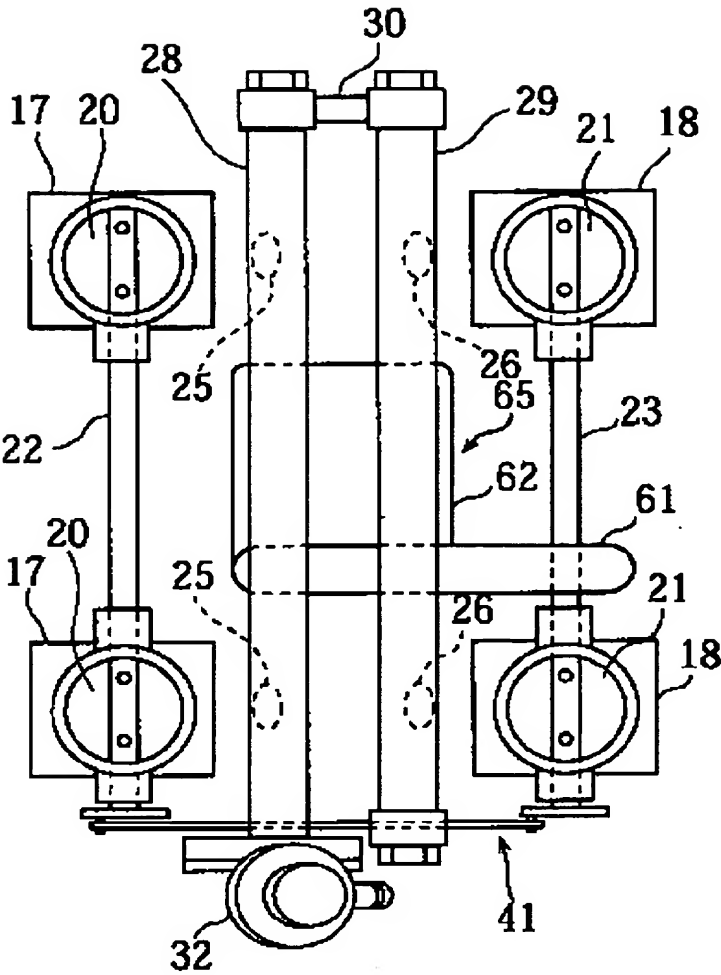
[Drawing 8]



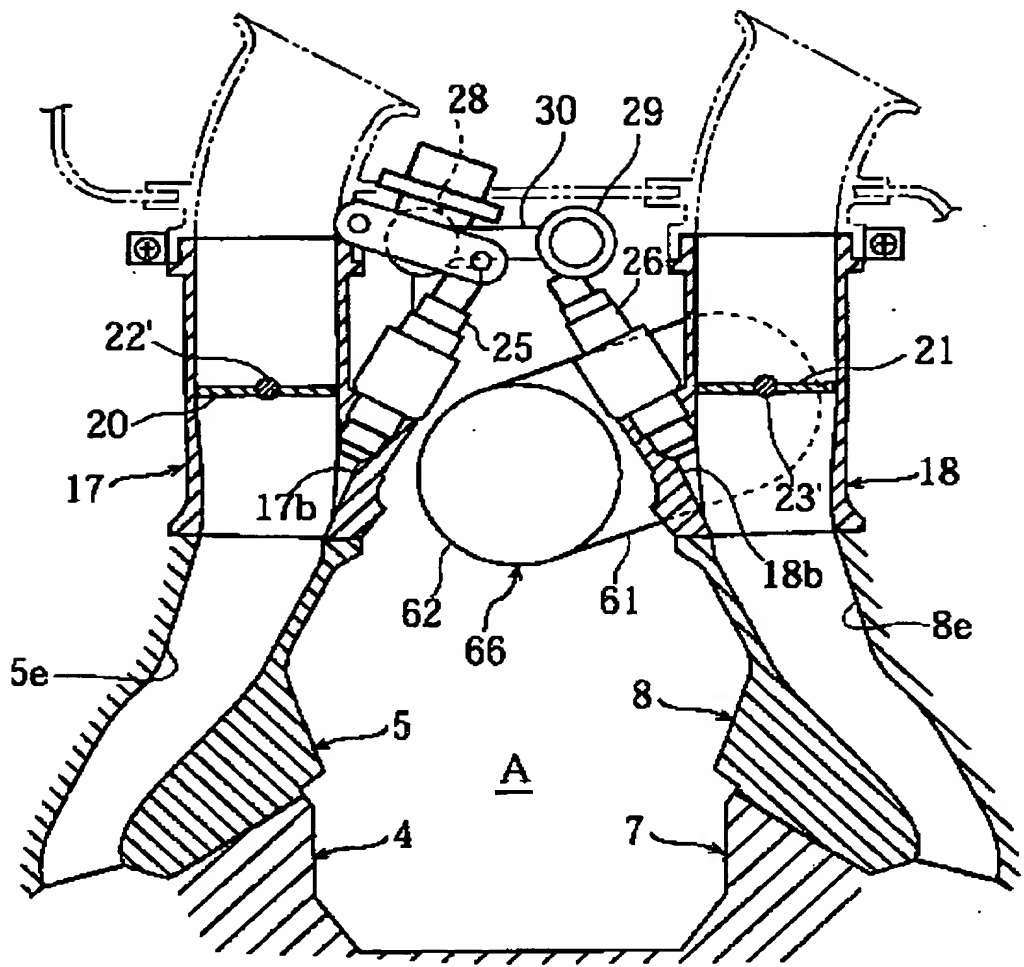
[Drawing 9]



[Drawing 10]



[Drawing 11]



[Drawing 12]

